

D.G.H. - D. EXPLORATION
LABORATOIRE DE GEOLOGIE DE BOUSSENS

GEO/LAB Bss n° 7/1517 RP
/fr

16/3.2 WELL (NORWAY)
SEDIMENTOLOGICAL STUDY
OF
THE TERTIARY DEPOSITS

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1 - INTRODUCTION

The 16/3.2 well (Norway) is located to the South of the 16/3 block, in the western part of the Odin horst.

Some paleocene sands were expected but are lacking, as in the other wells of this area.

This report summarizes the lithostratigraphical analysis which has been carried out on Tertiary material from 1220 to 1480 m.

A total of 20 sidewall cores and 10 complementary dish samples have been analysed using microlithological techniques.

The results of a palynological study have been used.

2 - RESULTS OF LABORATORY ANALYSIS

2.1 - CLAY MINERAL ANALYSIS BY X RAY

There are few changes in the clay mineral content.

The palynological nt III zone is characterized by a noticeable amount of kaolinite (20-30 %).

In the other zones the predominant clay material is smectite with some illite, and very little kaolinite and chlorite.

2.2 - LITHOLOGICAL ANALYSIS (Pl 1 and 2).

There are some slight changes in the shales, and a tentative zonation has been based on some characteristic features :

- presence of tuffa and ashes ;
 - abundance of glauconite ;
 - abundance of (pyritic micronodules ;
 (lignitic microdebris ;
 - colour of shales.
- . 1226 - 1275 m Dark brown shales : Dark brown shales with rare to frequent coaly microdebris, crystallopic silicified structures, pelagic microforaminifera. Probable thin levels of silt and dolomite.
- . 1275-1301 m Grey-green shales : Grey-green ± glauconitic shales thin level of argillaceous, micronodular siderite. Presence of a large Cyclamina (living in very deep water → information from micropaleontologist L. BRUN).
- . 1301 - 1356 m Pyritic shales and tuffa : Dark grey, grey-green and brown-red shales with abundant pyritic micronodules, siliceous stringers, local development of tuffa, presence of ashes.
- . 1356 - 1459 m : Brown to grey, lignitic shales: Brown to grey, ± silty, micaceous shale with frequent chloritic and glauconitic grains, local sideritic micronodules, rare crystallopic silicified structures. Frequent pyritized lignitic microdebris.
- . 1459 - 1480 m (base of the interval studied) Pelagic limestones :
- 1459 - 1470,50 m : Light grey, argillaceous mudstone with abundant Globigerinidae and other pelagic microforaminifera.
 - 1470,50 - 1480 : White wackestone with abundant Globigerinidae.

3 - SEDIMENTOLOGICAL INTERPRETATION

In the 16/3.2 well the most important criteria which support an environmental interpretation are :

- the lack of detrital grains ;
- the lack of evidence of energy ;
- the presence of an exclusive pelagic microfauna ;
- gaps in the palynological zones :
 - 1) lack of nt II b and Upper nt II A
 - 2) lack of nt I b.

This is indicative of an open marine environment in deep water, but without any traces of deep sea fan sediments.

Slight differences in the shales allow a zonation to be made.

Dark brown shales = nt III zone

Grey-green glauconious shales _ nt II c zone

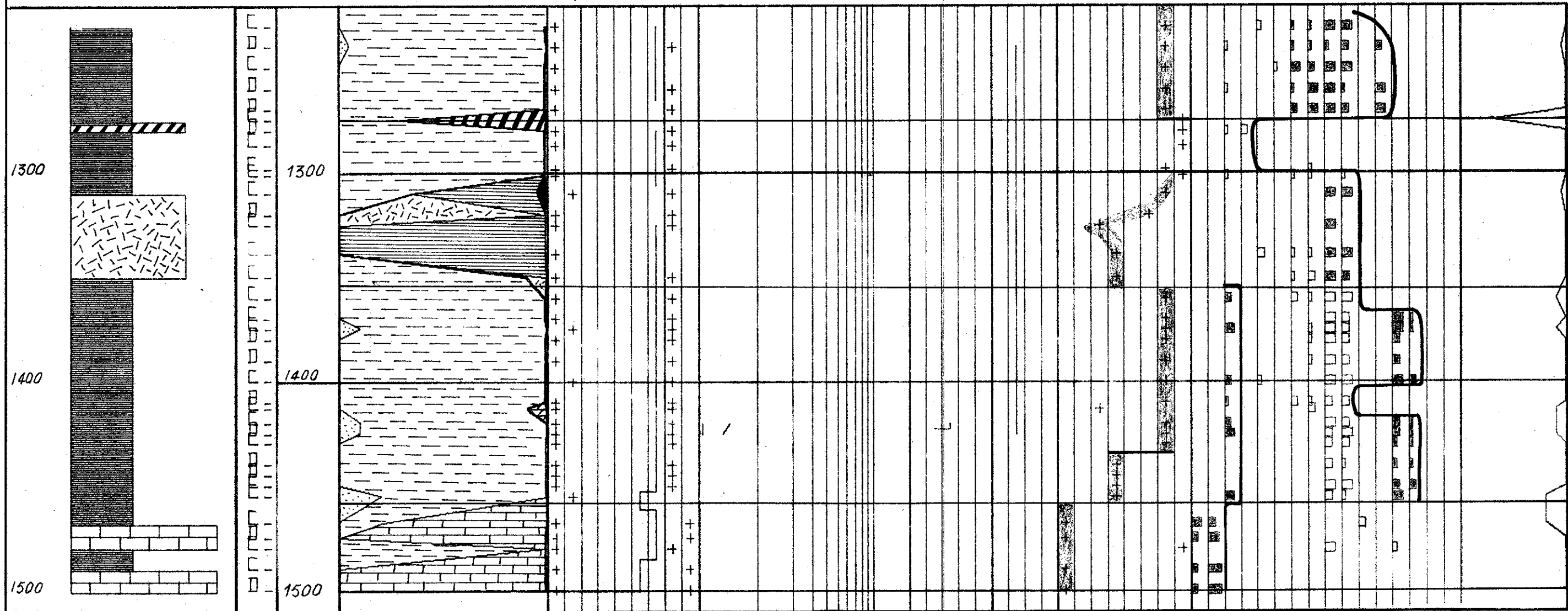
Brown-red shale = regionally at the top of the Upper nt II a where this zone is very thin

Pyritic shales and tuffa are normally regionally developed in the Middle nt II a

Lignitic microdebris are developed in the Lower nt II a and, nt I a.

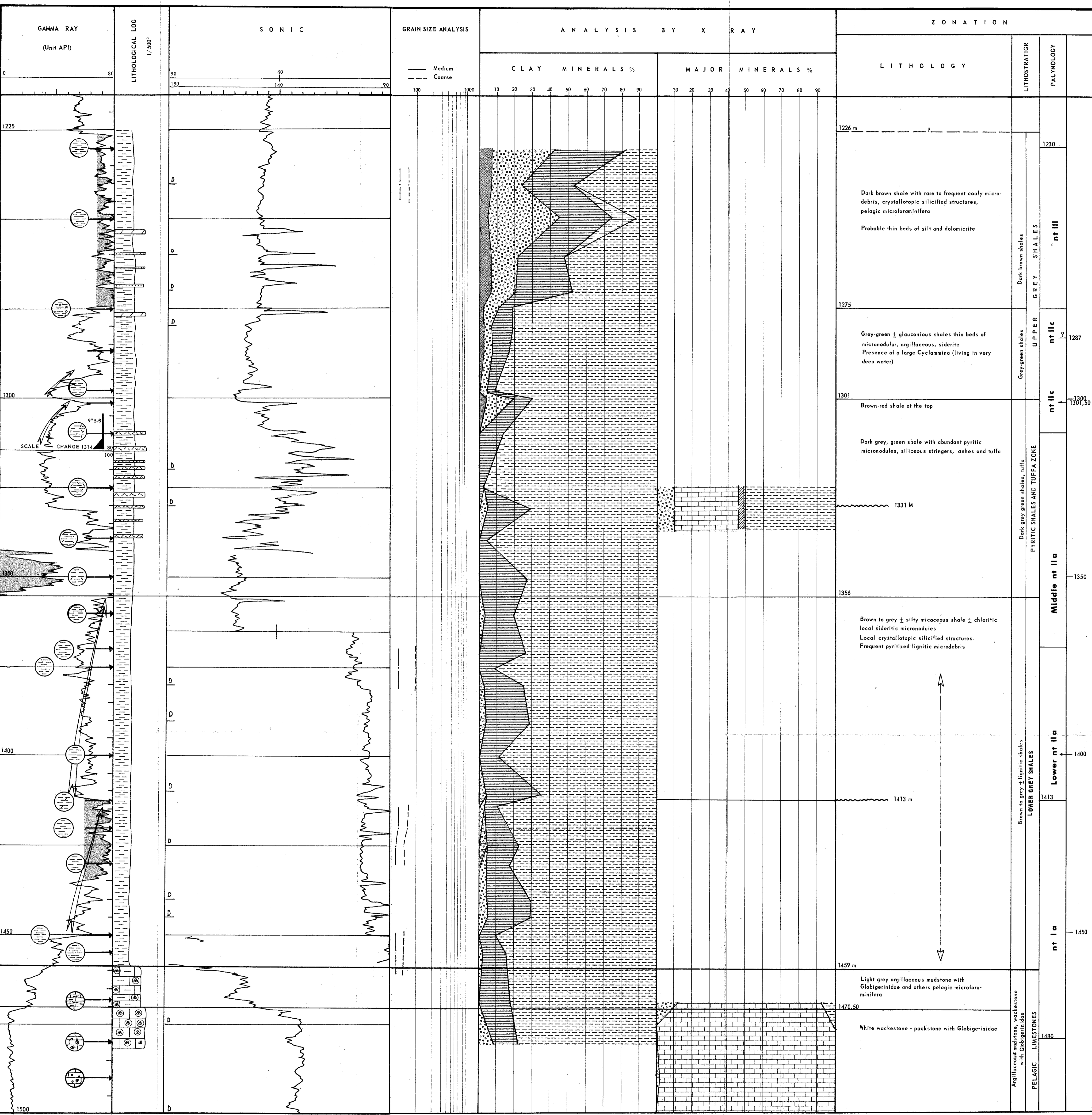
In conclusion there is probably no Paternal development of sands (lak of a deep sea fan system) in that part of the Odin horst.

DEPTHS	LITHOLOGICAL LOG	SAMPLE	DEPTHS	SEDIMENTOGENETIC FEATURES										CEMENT	ZONATION	
				PERCENTAGE OF MAIN CONSTITUANTS	STRUC.	TEXTURE	MATRIX	GRAIN SIZE ANALYSIS	CHARACTERISTIC		COLOUR	SECONDARY ELEMENTS	%	PALYNOLOGY	LITHOSTRATIGRAPHY	
									SORTING	MORPH.						
				QUARTZ SHALES SIDERITE SILICIFIED SHALE TUFFA PYRITE LIMESTONE DOLOMITE	MASSIVE LAMINATED	ARENITE GRAINSTONE ARENITE LUT. GR. JT. PACKSTONE ARENITE LUT. GR. FL. WACKSTONE LUTITE MIDSTONE SHALY LUTITE CALCAREOUS LUTITE	MODERATE FAIR	VERY GOOD FAIR MODERATE POOR VERY POOR	ANGULAR SUBANGULAR SUBROUNDED ROUNDED WHITE BUFF GREY BUFF GREY DARK GREY BLACK BROWN GREEN	GLOBIGERINIDAE OLIGOSTERINAE GLAUCONITE DOLITHES SILICIFIED MICRONODDULS FORAMINIFERA DIFFUS ORGANIC MATTER ORGANIC MATTER WITH DEBRIS PYRITIC MICROSIPHERULES CLOUDY PYRITE SHELL FRAGMENTS MICAS PYRITIC LIGNITE LIGNITIC DEBRIS	CEMENT AND MATRIX	20 40 60 80				



1230 m.	nt III	Dark brown shales
1275	nt IIc	Grey-green shales
1301	nt IIc	
1310	Middle nt IIa	Pyritic shales and tuffa
1356		
1370		
1413	Lower nt IIa	Brown to grey lignitic shales
	nt Ia	
1459		
1480	barren zone	

	Secteur NORWAY	PETRONORD
	Operateur Norsk Hydro Elf	
	Permis de Concession 007 block 16/3	
WELL 16/3-2 LITHOLOGICAL ANALYSIS IN BASAL TERTIARY SERIES		
Echelle 1/2000		
OY ENTREPRISE DE RECHERCHES ET D'ACTIVITES PETROLIERES DIRECTION EXPLORATION LABORATOIRE		Date July 77 Auteur CUSSEY N°classif C 1722



- Chlorite
- Kaolinite
- Chlorite + kaolinite
- Illite
- Illite + Smectite
- Smectite
- Quartz
- Limestone
- Pyrite
- Shales

Secteur NORWAY

Opérateur NORSK HYDRO ELF

Permis 007 Block 16/3

Concession

PETRONORD

WELL 16/3-2

DETAILED LITHOSTRATIGRAPHICAL CHARACTERIZATION TO BASAL TERTIARY SERIES

Echelle: 1/500

OP ENTREPRISE DE RECHERCHES ET D'ACTIVITES PETROLIERES

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